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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,815	08/08/2005	Keith Scott	0055714-000004	1158

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EXAMINER

CHUO, TONY SHENG HSIANG

ART UNIT	PAPER NUMBER
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1795

NOTIFICATION DATE	DELIVERY MODE
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10/06/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

Office Action Summary	Application No. 10/525,815	Applicant(s) SCOTT ET AL.	
	Examiner Tony Chuo	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 5-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 5-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/10/09</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Claims 1 and 5-12 are currently pending. Claims 2-4, 13, and 14 are cancelled. The previous objections to the specification are withdrawn. The previous 112, 2nd paragraph rejection of claims 13 and 14 is withdrawn. The previous 101 rejection of claim 14 is withdrawn. The amended claims do overcome the previously stated 102 and 103 rejections. However, upon further consideration, claims 1 and 5-12 are rejected under the following new 103 rejections. This action is made FINAL as necessitated by the amendment.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 6/10/09 was filed after the mailing date of the non-final rejection on 3/10/09. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

3. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled

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“Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase “Not Applicable” should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A “Sequence Listing” is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required “Sequence Listing” is not submitted as an electronic document on compact disc).

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In addition, the specification is missing the heading for the brief description of the drawings.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 5, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dearnaley et al (WO 99/13128) in view of Doyon et al (US 5558948).

The Dearnaley reference discloses a fuel cell having an anode, a cathode, and an electrolyte which is an ion exchange membrane, wherein the anode and cathode are immediately adjacent the electrolyte, wherein the anode comprises a catalyst that is deposited onto a support by vacuum deposition techniques, wherein the catalyst is a metal such as platinum, and wherein the support may be any number of materials (See page 5, lined 8-20, page 9, lines 7-10, page 21, lines 5-10, and page 22, lines 17-18).

However, Dearnaley et al does not expressly teach a wire mesh support of conductive material comprising strands defining pore and channels therebetween, wherein an electrocatalyst layer is only on the strands leaving the pores and channels substantially uncovered, wherein the mesh is made of a conductive material selected from metal, metal alloy, and metal composite. The Doyon reference discloses a catalyst support member "3" for a fuel cell that is a mesh comprising strands defining pores and

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channels, wherein the support member is a metallic material (See column 3, lines 7-16 and Figure 1A).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Dearnaley anode to include a wire mesh support of conductive material comprising strands defining pore and channels therebetween, wherein the mesh is made of a metallic material because the substitution of one known catalyst support for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Examiner's note: It is inherent that a catalyst deposited onto a mesh support by vacuum deposition techniques would only have catalyst on the strands while leaving the pores and channels substantially uncovered.

7. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dearnaley et al (WO 99/13128) in view of Doyon et al (US 5558948) as applied to claim 1 above. In addition, the Doyon reference also discloses a catalyst support member "3" that includes openings each of which has a size of 0.005 inch (127 μm) (See column 3, lines 10-12).

However, Dearnaley et al as modified by Doyon et al does not expressly teach a wire mesh support, wherein the mesh has a minimum pore size of 5 μm or 50 μm .

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Dearnaley/Doyon anode to include a mesh that has a minimum pore size of 5 μm or 50 μm because it has been held that the discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980). The pore size of the mesh

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support is a result effective variable of increasing the surface area of the catalyst support. In addition, there is no evidence of criticality of the pore size of the mesh.

8. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dearnaley et al (WO 99/13128) in view of Doyon et al (US 5558948) as applied to claim 1 above.

However, Dearnaley et al as modified by Doyon et al does not expressly teach a mesh that comprises a plurality of layers.

However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Dearnaley/Doyon mesh support to include a plurality of layers because the duplication of parts was held to have been obvious (*In re Harza*, 274 F.2d 669, 671, 124 USPQ 378, 380 (CCPA 1960)).

However, Dearnaley et al as modified by Doyon et al does not expressly teach adjacent layers of the mesh that are oriented at an angle to one another.

However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Dearnaley/Doyon mesh support to include adjacent layers of the mesh that are oriented at an angle to one another because the rearrangement of parts was held to have been obvious (*In re Japikse* 86 USPQ 70 (CCPA 1950)).

9. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dearnaley et al (WO 99/13128) in view of Doyon et al (US 5558948) as applied to claim 1 above, and further in view of Pollack (US 3835514).

However, Dearnaley et al as modified by Doyon et al does not expressly teach a mesh that comprises a plurality of layers, wherein adjacent layers of the mesh are

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oriented at an angle to one another. The Pollack reference teaches the concept of an electrode comprising a plurality of laminated metallic fibrous sheets, wherein the electrode consists of layers of parallel arrays of fine conductive fibers running in the longitudinal direction and layers of parallel arrays of fibers running at an orientation angle between 30° to 90° from the longitudinal direction of the fibers (See column 2, lines 44-55).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Dearnaley/Doyon mesh support to include a mesh that comprises a plurality of layers, wherein adjacent layers of the mesh are oriented at an angle to one another in order to strengthen the electrode by providing a stronger structure with a large number of contact points between the layers.

10. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dearnaley et al (WO 99/13128) in view of Doyon et al (US 5558948) as applied to claim 1 above, and further in view of Kaz et al (US 2002/0150812).

However, Dearnaley et al as modified by Doyon et al does not expressly teach a mesh that is made from titanium or titanium alloy; or at least one intermediate layer between the electrocatalyst and the mesh. The Kaz reference discloses an electrode assembly for use in membrane fuel cell comprising a mixture "8" (intermediate layer) applied to a carrier "16" (mesh support) that is a titanium mesh, wherein the mixture "8" is located between the reaction layer (electrocatalyst) and the carrier "16" (See paragraphs [0049],[0050],[0056]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Dearnaley/Doyon mesh support to include at least one intermediate layer between the electrocatalyst and the mesh in order to utilize an intermediate layer that improves the efficiency of the electrode. In addition, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Kaz indicates that titanium is a suitable material for use as catalyst support mesh. The selection of a known material based on its suitability for its intended use has generally been held to be *prima facie* obvious (MPEP §2144.07). As such, it would be obvious to use titanium.

Response to Arguments

11. Applicant's arguments with respect to claims 1 and 5-12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571)272-0717. The examiner can normally be reached on M-F, 9:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

/Jonathan Crepeau/
Primary Examiner, Art Unit 1795